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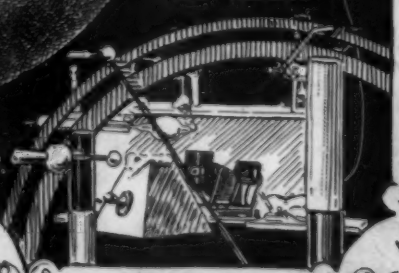
Vol. 7. No. 1. July, 1900.

THE AMERICAN X-RAY JOURNAL

571/8 Part 2

A MONTHLY DEVOTED TO THE PRACTICAL APPLICATION OF THE NEW SCIENCE AND TO THE PHYSICAL IMPROVEMENT OF MAN.



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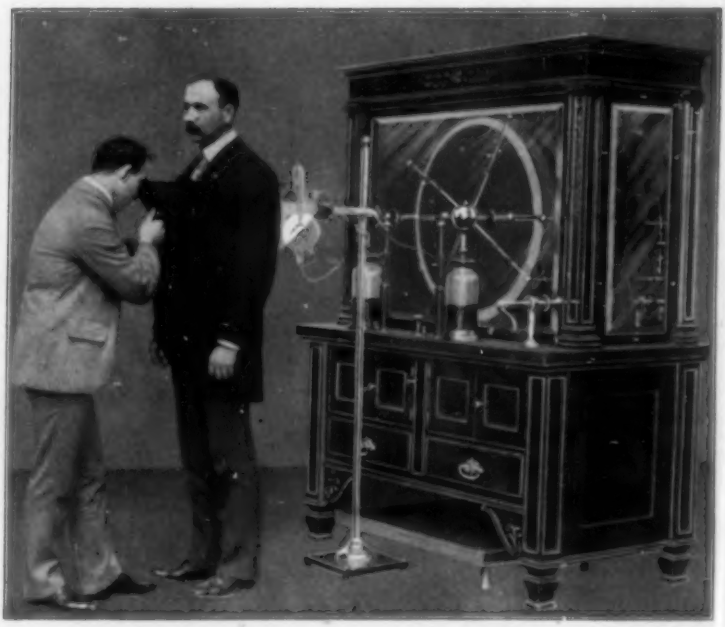

THE AMERICAN

X-RAY JOURNAL.

Devoted to Practical X-Ray Work and Allied Arts and Sciences.

PUBLISHED MONTHLY BY THE AMERICAN X-RAY PUBLISHING COMPANY.

HEBER ROBARTS, M. D., M. E., Editor.

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Roentgen Society of the United States — Constitution.

Excitation of the Crookes' Tube by the Static Machine.

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X-Ray Wins $15,000.

Improvised Static X-Ray Machine.

International Congress of Medical Electrology and Radiology.

Epithelioma.

Printing by Roentgen Rays.

Broken Neck.

Roentgen and Becquerrel Rays.

Another X-Ray Trick.

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DR. CARL BECK.

The American X-Ray Journal.

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ROENTGEN SOCIETY OF THE UNITED STATES.

The preliminary announcement and invitation, to those wishing to become charter members has been sent to the profession not now members. The list is growing very satisfactorly, and will serve as an incentive, we hope, of prompting all the X-RAY workers to affiliate with us at an early date, before the committees will be named by the president.

The usefulness of the Roentgen Society of the United States depends much upon the number and character of the work done by its members at the annual meetings. No worker or man devoted to this new branch of surgery, medicine and science can afford to deprive himself of the advantages of this society, which object it is to find the best means of stimulating thought, encouraging research, prompting an increased diligence, and at the same time receiving the concentrated benefits of the best of the original work of scientific talent in the columns of its official organ THE AMERICAN X-RAY JOURNAL, the only one of it's kind in America.

This society is a national one and is already represented by members from every state. All those wishing to become members may do so by sending five dollars, with the necessary application directly to the secretary of the society. Remittances should be made by check, draft, registered letter, money or express order.

Roentgen Society of the United States will hold its first regular meeting at New York, N. Y., in December, 1900. Many able papers have been promised and a very successful scientific meeting is assured. Members desiring to read a paper should forward it's title to the Secretary at least two months before this meeting. Every paper received by this society and ordered to be published, and all plates or illustrations, shall be considered the exclusive property of the society, and will be published in the official organ of the same. There is no objection of reproduction of anything published in the journal, if proper credit is given. No paper shall be read by title, which is not actually in the hands of the officers of the society. The Committee on Publication will be expected to use their discretion in publishing only such reports and papers of the transactions as, after careful examination, it may conclude will be instructive and do credit to the society.

The transactions of the first meeting and organization of this society, with the Constitution, published in the March number of the JOURNAL will be sent on application. Write to Dr. Heber Robarts, President, 310 Chemical Building, St. Louis, Mo., or secure your receipt from the Secretary and he will take pleasure to place your name as a member on the list and in sending you the copy of the JOURNAL.

All other information will be cheerfully given. DR. J. RUDIS-JICINSKY,
Secretary.

Cedar Rapids, Ia.

Application Blank.

ROENTGEN SOCIETY OF THE UNITED STATES.
APPLICATION FOR MEMBERSHIP.

I hereby make application for membership in the Roentgen Society of the United States.

Signed .....
Full name.

P. O. Address .....

$5.00 must accompany each application. There is no initiation fee. The official organ, "THE AMERICAN X-RAY JOURNAL," free. Send this slip with enclosure to Treasurer and Secretary:

DR. J. RUDIS-JICINSKY,
Cedar Rapids, Iowa.

X-Ray Photograph—Bones of the Foot.
Tube excited by an eight, twenty-eight inch revolving plate static machine, employing one extra spark gap.

The Editor of the AMERICAN X-RAY JOURNAL will gladly answer any inquiry upon X ray matter. Postage should accompany such inquiry.

EXCITATION OF THE CROOKE'S TUBE BY THE STATIC MACHINE.

Condenser Discharges.

BY JOHN T. PITKIN, M. D.

CHAPTER V.

By the capacity of a receptacle is implied its ability to receive, retain or contain a given maximum quantity of certain forms of matter or become the seat of a given amount of some particular force or forces, e, g. A certain individual posseses a stomach which can contain three pints of liquid nutriment, a bladder able to retain two pints of urine, a brain capable of becoming the seat of a given number of units of intellectual activity, but this does not necessarily imply the presence of any substance in the hollow viscera mentioned on the one hand, or a given amount of active cerebration on the other, simply the possibility of the utilization of these organs and their maximum limitations. This homely homologue is employed to preface the consideration of the capacity of electrical conductors and condensers, to elucidate the difference between the amount and pressure of the abstract electro-magnetic forces, and the ability possessed by metallic surfaces enveloped in a dielectric to retain, convey or modify the co-ordinating energy. The capacity of an electrical conductor may be defined as its power to receive, convey or retain a given amount, or milliamperage of electricity at a given potential, i, e, how much it is capable of holding upon its free or external surface, when surrounded by a given dielectric of a specified thickness, the relation of said surface to all other conductors, the electrical condition of the latter and the magnetic condition of the environment being duly considered.

The unit of electro-magnetic capacity is called the microfarad. The capacity of a Holtz static generator, is in direct proportion to the areal expansion of its integral metallic conductors, rods, combs, rod-holders and prime conductors includ-

ing the bulbular enlargments in which the last mentioned objects terminate. When the machine contains but a small number of revolving plates the milliamperage is necessarialy very meagre, then large prime conductor balls may be employed as a compensating measure, their modus operandi and effects upon the current will be considered later. A more more efficient means of obtaining the critical capacity for a given instrument to be used for a specific purpose is found in the employment of one or more accessory condensers in the form of Leyden jars. As these jars are the type of all condensers, the structure and function of their various parts will receive passing mention. Wide mouthed bottles made of crystal or dielectrical glass devoid of all metallic ingredients are lined on their inside surface, from one third to one half the distance from the bottom upwards with tin foil. The outside is similarly covered. All portions of the bottles receive several coats of varnish to close the pores of the glass and thus overcome its hygroscopic properties. The covers of the jars are made of baked hardwood. Through the center of these covers passes a metallic rod terminating in a bulbous expansion above and a chain which is electrically connected to the inner coating of the jar below.

To charge the condenser the bulb of the jar is placed against one of the prime conductors of the generator, if the polarity of that side of the machine is positive, the inner coat of condenser is similarly electrified by conduction the outer coat negative by induction, and the intervening glass to become the seat of a magnetic field.

After the jar has been completely excited it cannot re-

Arthritis Deformens of Wrist-joint.

Skiagraph taken with tube excited by atatic generator which has ten revolving thirty inch plates. Two extra spark gaps were placed in the circuit.

X-Ray picture showing bones of hand bullet in wrist, buckshot in palm, and plain band ring on finger.

Tube excited by a twelve twenty-eight inch revolving plate static machine, employing Leyden jars as static transformers.

ceive any more electrical energy. To discharge the condenser the plates can be brought into metallic connection with each other or a spark gap may be formed by breaking the continuity of the discharger before it is applied to the coatings. In the latter case a convective spark discharge will pass across the interruption of continuity and a Crooke's tube placed in the spark gap will be momentarilly lighted

When a Holtz generator, in operation, has two Leyden jars placed in the circuit the coats of these condensers are unloaded through the discharging rods of the prime conductors. Such a static generator may be considered as a self exciting Leyden jar. All the metallic portions of one half of the apparatus represent the inner coating of a jar, opposite side the outer coating, the intervening air is the dielectric. This explains why in the starting of a static machine into action some time must elapse before a sufficient difference of potential is obtained to establish a convective discharge between the rods of the prime conductors. The longer the air gap the greater the potential difference required.

The larger the condensing surface placed in the circuit the longer will be the time required to establish the critical difference and the less frequent the discharges for a given air-gap, and the greater will be the milliamperage of the current. The longer the air-gap or total gaps the higher voltage required in order to overcome the same, and the smaller the condensing surface that will be necessary to obtain a given quantity of electricity. Each Crooke's tube will operate best when supplied with a current of a certain specific quantity, driven by a critical voltage or pressure, i, e, the voltage must be sufficient to overcome the air-gap in the tube plus any other gaps which have been superaded An excessive voltage is not only an idle waste of energy which can be seen escaping from the conducting cords and various portions of the apparatus, but it also vitiates the x-ray effects, strains the tube, and may cause electro-chemical burns, to tissues accidently placed within its pathway. When the quantity of electricity supplied by the machine is below this critical milliamperage, Leyden jars q, s, should be placed in the circuit. Spark gaps can be increased in length or number and the machine run at greater speed.

To tersely recapitulate. The voltage of a static machine is a function of, 1. The size of the plates, 2. Time or speed at which they are driven, 3. The length of the spark-gap, 4. The condensing surfaces placed in the circuit. The milliamperage is a function of, 1. The number of plates, 2. Capacity of the conductors, 3. Speed, 4. Length of spark-gap, 5. The magnetic discharges.

X-radiance is a function of a critical current driven through a specific x ray lamp at a critical voltage. Any fairly good static machine irrespective of size or construction can be made to perform the most difficult x-ray work when its operator has thoroughly mastered the corelation of the forces of electricity, magnetism and x-radiance and their relation to matter through which they become manifest.

BUFFALO, N. Y.

The Roentgen Society of the United States will meet in New York City in December of this year. The exact date and place of meeting will be announced in the next issue of the official organ—the AMERICAN X-RAY JOURNAL. Papers have been promised from a number of widely known physicians, surgeons and physicists. Manufacturers of x-ray apparatus and accessories together with electro-therapeutic machines will provide for ample exhibition room. The largest and most complete display ever made will be at this meeting.

The demand for x-ray apparatus is increasing. Physicians in towns are preparing to do the work done in large cities.

EXCITATION OF THE CROOKE'S TUBE BY THE STATIC MACHINE.

Conduction.

BY JOHN T. PITKIN, M. D.

CHAPTER VI.

The force which we call electricity may be said to exist in two conditions. (1), Potential, neutral, passive or latent. (2). Kinetic or active. In the latter state it is divided into two equal but dissimilar quantities, i. e., positive and negative and a secondary variety of energy called magnetism becomes manifest. Magnetism is always kinetic, never at rest, but incessantly struggling to close up its lines of force and bring about the restoration of an electrical equilibrium. During the process of restoration the magnetic energy may be utilized in the prosecution of manifold mechanical procedures. The function of a static machine, a dynamo or a battery, is to separate the two varieties of electricity from each other and the generation of magnetism. In our effort to draw a mental picture of the process called conduction let us endeavor to embody the ideas of all the more modern electrical experts, assuming in the absence of contradictory proof, that their op'nions partly founded upon the results of elaborate experimentation and partly hypothetical represent the best obtainable working formula of the modus operandi. They teach us that the process varies with the composition and density of the medium through which the electricity is exhibited. Thus in the air or other gases, two opposite directed streams of molecules, each individual carrying an electrical charge, play between the metallic electrodes. Owing to the resistance of gaseous mediums a relatively high E. M. F. is required for its maintainance. If the intervals between the electrodes are increased in length or number their potential difference must be proportionately intensified. (See chapter entitled Convective Discharges, February issue.), American X-Ray Journal. The propagation of the electrical energy through liquids is accomplished by an alternating of anylitical decomposition of the compound into its constituent atoms and their synthetical recombination, each time the atoms changing partners in such a manner as to keep the positive atoms, electrically charged, moving towards the negative electrode and the positive atoms in the opposite direction. (See R. A. Witthous' works on chemistry.) Conduction by solid media. When the two ends of a metallic wire attached to the two sides of a static machine, a dynamo, or a battery, in operation become simultaneously electrically excited the one positive the other negative then the outer layer of molecules entering into their composition take on a specific rate of vibration (motion being an inherent property of matter.) Page 2. The electrical character of the the particles causes them to become polarized so that their axes correspond with the length of the wire, the positive ends all facing in the direction of propagation of the positive waves and their negative sides facing with the negative waves. The molecules of the surrounding medium, the dielectric are also polarized but at right angles to the components of the electric. From the positve conductor the positive ends project outwards, conversely from the negative wire the negative sides face exteriorly. This condition of the surrounding medium constitutes the magnetic field of force. The magnetic field is frequently intensified by winding the conductor into a coil, then its power in a given space will obviously be proportionately augmented. The excited dielectric consists of a polarized surging medium, expanding under restraint or tension like a bow which is bent or a spring which is wound with a tendency to recoil or be released (Magnetic Discharges) through the instrumentality of conducting objects, and, directly or indirectly establish an electrical equilibrium. Your humble scribe ventures the suggestion that

the magnetic influence of the earth may be a factor tending to bring about the molecular re-action. Isolated conductors, irrespective of shape placed within a magnetic field are electrified in the same manner as if they comprised but a single molecule of matter. A change in their position necessitates a re-adjustment of the charge and causes an electrical flow. Thus if a secondary closed coil of wire is moved through a magnetic field, it will become a conductor of an induced current. When the electrical action of a primary circuit is intermittent, e, g, if extra spark gaps are employed for x-ray work, although a secondary conductor remains stationary the latter will be electrified with an intermittent current of the opposite polarity. Hence two or more metallic objects, gas, water or steam pipes, etc., etc., of an apartment may be inductively charged, and form a remote secondary circuit thus wasting the energy of the static generator. One or more conductors electrified by induction may communicate with dissimilar poles of a poorly insulated machine with the same result. These facts have given rise to the fallacious ground wire dogmatism.

So extended is the influence of the magnetic field of high tension electrical apparatus (the magneto motive force of the field corresponding in intensity with the electro motive force of the current with which it co-ordinates) that its waves of force can be intercepted at a considerable distance from the generator to produce induced currents in a Hertz coherer and a Ruhmkorff coil thereby establish communication called wireless telegraphy.

It follows that the wall, ceiling and floor of an apartment are unavoidably effected by induction, that they should as far as possible be made of non-conductors, and the wood-work oiled or varnished. Great care must be taken that the machine, Crooke's tube and the patient are perfectly insulated otherwise the stray conducting and the inducting actions may intermingle and reduce the efficiency of the generator. With the moderate E. M. F. actually required for the best x-ray work the metallic objects of the apparatus, rods combs and wires constitute the only conducting paths and from these there will be no wind, spray or glow discharges, but if the voltage is unnecessarily high the woodwork, unvarnished glass and humid atmosphere become fair conductors, each dissipating a portion of the electrical current, under these conditions feelings of slight drafts, sprays or like cob-webs upon the hands and faces of the bystanders may be experienced, and the wires of communication between the Crooke's tube and the machine will emit a purple glow, all of which represents wasted electrical energy.

BUFFALO, N. Y.

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OFFICE OF THE SECRETARY, CEDAR RAPIDS, IOWA.

JUNE, 1900.

This certifies that W. A. Price, D. D S. from Cleveland, Ohio, United States, America, has been regularly admitted as a member of the Roentgen Society of the United States and that in accordance with, and under the provisions of the Constitution of the Society, he is appointed as a delegate, to represent that society and to participate in the International Congress of Medical Electrology and Radiology, in Paris, France, from the 27th of July to the 1st of August, 1900.

In witness whereof, the Roentgen Society of the United States, has caused this to be signed by its President and Secretary this 20th day of April, one thousand nine hundred.

J. RUDIS-JICINSKY, Secretary. HEBER ROBARTS. President.

Physicians who desire to be posted in what is being done in x-ray work should read the American X-Ray Journal. Subscribe now.

DIRECT METHOD OF MEASURING X-RAY INTENSITIES.

BY DR. FREDERICK STRANGE KOLLE.

The present fluoroscopic, photographic and ionization methods of measuring the intensities of Roentgen rays are, more or less, subject to such inaccuracies as to make them very unsatisfactory.

The faults are due primarily to variations in the generating apparatus and secondly, to the difference of ray intensities given off by a tube used as a standard, while in the photographic process the several chemical processes produce results, however slight, that occasion often visible variations.

To Mr. Perreau* we owe the discovery that selenium is acted upon by the rays in somewhat similar manner as ordinary light, except that the action is not as active, or powerful, if you please.

Knowing that electric waves have no influence on selenium, it becomes at once an agent applicable to the direct method of measuring the intensities of x-light. Again the simplicity of the apparatus recommends it to the general physicist.

The apparatus to be employed is made up as follows:

A disc or strip of selenium, such as is furnished by manufacturers for experimental purposes is inclosed in a hard rubber case having a thin aluminum shutter on the side to be brought in close proximity to the active tube. A hard rubber rod, six inches in length, supports the case from the base plate of wood.

Two copper strips or wires are connected to the selenium at the top and bottom and attached to binding posts placed under the cases, to which one of the wires from the battery and the galvanometer are connected.

A battery of 10 chloride of silver cells is introduced between one binding post and the galvanometer.

*Perreau. Comp. Rend. 129 pp. 956-57.

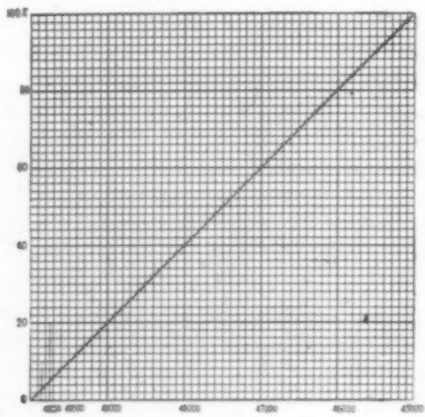
The galvanometer should be of the mirror type.

A contact keg is placed in circuit to facilitate the weakening and breaking of the current.

To increase the x-light intensity the resistance of the selenium is first noted.

The apparatus is then brought near the tube with the aluminum shutter facing the latter at a distance of two inches.

The tube is put into action and the resistance of the selenium cell is again measured after the oscillation of the reflected light ray has assumed a minimum. A decided difference in the resistance of the selenium is noted, varying, if in the first



measurement it corresponded to 50,000 ohms, as much as 6,000 or 7,000 ohms.

In calculating the resistance of disc let

R = resistance of selenium disc (normal)

R_x = resistance of selenium disc (x-ray)

D = deflection corresponding to R

D_x = deflection corresponding to R_x

then the galvanometer deflection varies inversely as the resistance, or,

$$D_x : D :: R : R_x$$

from which

$$R_x = R\frac{D}{D_x}$$

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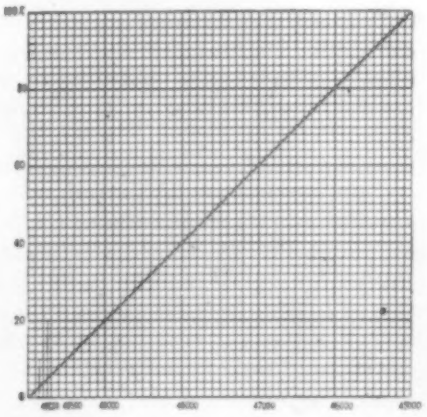

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*Perreau. Comp. Rend. 129 pp. 956-57.

been employed, then the former represents 100 per cent and the latter 0, (zero) x-ray intensity.

A table, as follows, may be prepared by which the efficiency of a tube can easily be computed:

X-RAY INTENSITY. Per Cent.	Rx
0	50,000
10	49,500
20	49,000
30	48,500
40	48,000
50	47,500
60	47,000
70	46,500
80	46,000
90	45,500
100	45,000

In like manner a chart (as shown in Fig. 2) with the values given and intermediate values could be prepared from which the tube efficiency can be read off directly.

BROOKLYN, N. Y.

Accessories to the x-ray machine are increasing daily. Methods for the treatment of lupus, psoriasis, eczema and for epilation purposes require modes of application characteristic of the ailment. It is not sufficient to have a generating apparatus. Besides knowing the nature of the tube, the measure of intensity must be known. To gauge intensity, instruments are required. It is also necessary to have appliances that will limit the field of exposure by the will of the operator. Display of these new inventions so practical for the physician using x-rays, will be on exhibition at the December meeting of the Roentgen Society of the United States.

Roentgen Tube.—KURLBAUM.—A description of a new Roentgen tube with a Pabst anticathode. In order to keep the anticathode at a low temperature, it is covered electrolytically with platinum black, as this has a very great power of emission for heat rays, while that of platinum is very small.—*Elek. Ziet.*, March 22.

X-RAY REVEALS OPEN SAFETY PIN IN THE RECTUM.

May 5, 1900.

EDITOR AMERICAN X-RAY JOURNAL:

DEAR SIR:—The following case came before me recently and as I thought it would be interesting to the readers of your valuable journal, I quote you the circumstances which are as follows:—

A baby girl, fourteen months of age, from a suburban town swallowed an open safety-pin on Monday April 23rd, and caused her parents untold anxiety, lest it should bring about her death.

A physician was called at once and made an examination of the throat but could not locate the pin and ordered the parents to feed the child on rice and other starchy foods, hoping that these would carry the cause of all the trouble away when the food passed from the child. However, this treatment failed to have the desired effect, and on April 26th, the attending physician advised the parents to take their child to Dr. Earnest Laplace, Professor of Surgery of Medico-Chirurgical College and Hospital, for him to locate the pin and operate for its removal.

Prof. Laplace submitted the patient to x-ray examination. A fluoroscopic examination revealed nothing.

The child was placed on a 14x17 inch plate, back downwards and, as she was constantly screaming and twisting it was necessary to hold her extremities firmly, to get any results at all. In spite of all efforts to hold her quiet, crying caused her abdomen to rise and fall incessantly, necessitating the use of a high vacuum and short exposure, about half a minute.

Upon developing the plate it was found to be very weak and the abdomen looked like an unexposed blank plate. By the use of a ground glass, at a certain degree of inclination, the lung was visible, and a suspicious shadow in the region of the sigmoid flexure, slightly resembled the ends of a safety-pin, but being very faint,

little dependance could be placed upon it. It was decided to make another attempt.

This time we placed two safety-pins on top of the abdomen, one vertical and the other horizontal, fastening them with adhesive plaster. This was done in order that the shadow of the offending pin could be positively identified.

An exposure similar to the previous one was made and, on developing the plate, the negative revealed the safety-pin in the upper portion of the rectum, very much more distinct than the pins we placed on the abdomen. This fact is accounted for by the circumstances of the latter being further from the plate than the former, and the abdomen being in a constant state of motion. The straining of the child in her efforts to extricate herself, had pressed the pin downward so far that it showed in the upper portion of the rectum with the end pointing upward.

About the time we had finished the plate the pin was passed with a hard mass of feces, in which nature had incased it, in order to prevent the points from piercing the intestine.

This case should indicate that we should not be alarmed by children swallowing small foreign bodies like tacks, pennies, etc., as nature provides her own process of disposing of these things.

A lesson is also taught, that if an operation is found necessary, it should be performed immediately after the foreign body is located, because the peristaltic motion of the intestine, these bodies have a tendency to move downwards.

The above case brings to mind a demonstration given by the celebrated "Ostrich Man," a professional glass eater, given before the students of the Medico Chirurgical College a few weeks ago. Immediately after the exhibition, an x-rays photograph of his stomach was taken, which revealed the matter he had eaten, consisting of forty tacks, six horse shoe nails, five large screws and many pieces of broken glass.

This instance would indicate that th mucous membrane of the intestine is not easily endangered by foreign bodies.

Yours respectfully,

M. K. KASSABIAN.

Skiagrapher to the Medico-Chirurgical College and Hospital, Philadelphia, Pa., U. S. A.

Skiagrapher to the Medico-Chirurgical College and Hospital, Philadelphia, Pa.

Congres International d'Electrologie et de Radiologie Medicale.

At the request of the French Society of Electrotherapy and Radiology, the International Congress of Electrotherapy and Radiology, is attached to the International Congress of 1900.

The committee which is charged with the organization of the Congress embraces the names of M. Weiss of the French Faculty of Medicine, as president; Messrs. Apostoli & Oudin, vice-presidents; M. Domer, of the French Faculty of Medicine, secretary-general; M. Montier, secretary; Boisseau du Rocher, treasurer; and also M. M. Bergonie, Bonchacourt, Branly, Broca, Larat, Radignet and Villemni.

This Congress will take place at Paris, from the 27th of July to the 1st of August, 1900. For further particulars, address, M. C. professeur E. Donmer, 57 Rue Nicolas-Leblanc, Lille, France.

Every physician setting fractures should use the x rays with the intention of proving the picture at the start. The proof of the picture can only be made with impervious right angle devices capable of casting a shadow. Such radiographs are accepted in all competent courts.

At the meeting of the Roentgen Society in New York City, in December, there will be offered advantages to the visiting members for instruction in x-ray work that cannot be had under any other condition.

Shall the Specialist Divide the Fee with the General Practitioner?*

BY EMORY LANPHEAR, M. D., PH. P., ST. LOUIS, MO.

Formerly Professor of Surgery, in the Kansas City Medical College and the St. Louis College of Physicians and Surgeons; Gynecologist to St. Joseph's Sanatarium.

When an attorney in a county-seat has a client in danger of the penitentiary and hence in need of the very best of council, it is customary for him to seek some eminent lawyer of a great city and request his aid. In so doing, does he approach the distinguished gentleman and say: "I have a client accused of ———, who is able to pay $3,000 for his acquittal; will you take the case with me for this sum —— leaving me the gratification of having done my professional duty?" By no means! He plainly states: "My patron has $3,000 for his defense; are you willing to take $2,000 of this to join me in securing justice for him?"

Arrangements of this kind are made daily in every large city. Does anyone ever suggest that the country attorney has been doing a dishonorable act in thus securing his brother practitioner to do the major part of the work for the $2,000, he retaining $1,000, for his services? Would a doctor, sued for $100,000, regard such a transaction as disgraceful, unethical, objectionable, if thereby he were saved this sum?

But let the question be one of saving life instead of securing liberty, or preventing financial loss—and how different it is!

If a country doctor have a patient with recurrent appendicitis (upon whom he might operate with success, but fears possible failure) with a prospective fee of $600, must he—in order to be "ethical"—write to some city surgeon to come to his help, take all of the $600 and leave him merely the satisfaction of a duty well performed, or possibly pay for a few visits at starvation rates? "Upon what meat doth this our Ceasar feed that he hath grown so great?"

Why should not the country doctor plainly say to the city specialist: "I have a patient with appendicitis who is able to pay $600. Will you operate for $400 and leave me $200 for preparation, after-treatment, etc?" What would be wrong about this? Let Drs. Robt. T. Morris, of New York, and Burnside Foster, of St. Paul, who so vigorously maintain that division of the fee is unethical under any and all circumstances, point out what injustice would thereby be done to (a) the patient, (b) the attending physician and (c) the eminent surgeon. Why should we not learn a few things from the methods of our most noted lawyers, men who are above suspicion as to unethical conduct? Have we not hitherto been too unmindful of the financial interests of ourselves and our professional brothers?

I maintain that the payment of a "commission" for all business simply "referred" to a specialist, or for mere consultations, is probably unethical—certainly demoralizing in tendency; but that division of the fee is perfectly honorable and right when the specialist and the general practitioner jointly share the work and the responsibility.

*Extract from paper read before the Missouri State Medical Society, May 1900.

Mechanical Actions of Crooke's X-Ray Tube.—MICHKINE.—A Russian Physical-Chemical Soc. paper. A light magnetic needle placed in the field of a Crooke's tube will take a position parallel to a line joining the electrodes; the same is true of a needle of non-magnetic material or a dielectric. One of larger dimensions will start to turn if it is given a slight impulse; it will turn in either direction but with different velocities. A thin celluloid disc on a pivot affords a simple and convenient means for exploring the field of a Crooke's tube. Some conclusions thus arrived at concerning the field are given.—*Jour. de la Soc. Physico-Chimique Russe*, Vol. 31; abstracted in *L'Eclairage Elec.*, Feb. 3.

Relief for British-Boer War Sufferers.

The following letter from the London office of The Antikamnia Chemical Company, under date of March 2nd, 1900, will be found interesting.

DEAR SIRS:—It was suggested to me a few days ago that I should contribute some Antikamnia to one of the Hospital Ships going out in charge of Dr. Conan Doyle and Surgeon O'Callaghan, F.R.C.S., the latter of whom is well known to me, and has a very substantial practice. I have contributed to this Hospital Ship and to 'Maine,' equally, in your name, the following exact number of ounces, viz: 12 dozen ounce of Antikamnia Powdered and 24 dozen ounces Five-Grain Antikamnia Tablets, in all 36 dozen ounces, and I feel certain that you will readily endorse what I have done. This constitutes the first introduction of Antikamnia, in quantity, to the Army Medical Service of Her Majesty.

February sales show nearly double the volume of sales for February, 1899. Rather a pleasant report to make, is it not? Regular monthly statement by next post.

Yours very truly,
THE ANTIKAMNIA CHEMICAL COMPANY,
Per J. M. Richards.

REPLY.

ST. LOUIS, MO., U. S. A.,
March 14th, 1900.

DEAR SIR:—In reply to your favor of March 2nd, 1900, we beg to say that the contribution of 36 dozen ounces of Antikamnia Preparations to Hospital Ships, may most agreeably be charged to account of Home Office.

We must thank you for your timely thoughtfulness in making these donations. We have, on this side also, contributed liberally to the Boer Relief Fund, through the local representative, Dr. Emil Preetorius, of this city.

Glad to note your reference to increased sales, etc.

Sincerely yours,
THE ANTIKAMNIA CHEMICAL COMPANY.
Frank A. Ruf, Pres't.

The pure ozone, the life-giving properties of the river air of the Upper Mississippi River builds up the system in a surprisingly short time and is hailed alike by the invalid and the pleasure seeker.

Upper Mississippi.

The passenger route from St. Louis to St. Paul on the Diamond Jo Line Steamers, affords one of the most enjoyable and health giving trips in America. Persons seeking rest and cooler air in northern points will find this the most happy and restful of their entire summers' outing.

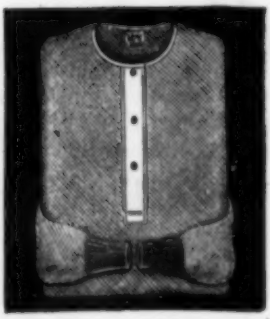
The beauty of the Upper Mississippi is historic, as is heard in the legends of the aborigines, and since appreciated by the white man and sang in modern verse.

Passengers have freedom to the steamers decks, drawing rooms and prominades which removes all restraint from crampt travel. Nothing has been spared to contribute to the comforts of passengers. The genial captain, attentive purser and kind matron combine to meet every want. The cuisine is inviting and the state rooms are models of cleanliness. Good bye mosquitoes and flies! They are not in this route. More comfort in travel than at home, has been the study of American art, but no where out of the Upper Mississippi has man and nature combined in greater pleasantries.

Roentgen Rays.—ROLLINS.—An illustrated continuation of his long serial, giving notes on the occlusion and chemical combination of hydrogen in the glass of the tubes; also on heating Roentgen tubes having high resistance. The resistance of a tube is not an indication of the degree of the vacuum. Tube makers should not take a tube from the pump unless it glows with a brilliant, white light, after the current has been cut off; this phosphorescence is always present in a fine tube. Then follow notes on the "radiant area plume," on the fan of the Varley stream, and on "non-radiable cases for x-light tubes"—*Elec. Rev.*, Apr. 11.

Roentgen Rays.—Rollins.—A continuation of his illustrated serial. When a tube has become useless, he recommends filling it

GREAT MINDS CHANGE.



Emmet Densmore, M. D., 1891.

"Woolen garments in underclothing and bed-clothing are greatly superior to those made of vegetable fiber, be they cotton or linen."—From How "Nature Cures."

It takes a strong mind to have convictions, but a still stronger one to change them if found erroneous.

Emmet Densmore, M. D., 1899:

"LINEN IS THE BEST MATERIAL FOR UNDERWEAR,:

It absorbs moisture more readily than wool, and also gives it off more readily, and the body is thus encased in dry instead of damp garments. Cotton is a compromise between wool and linen.—From "Consumption and Chronic Diseases."

The above change was brought about by an investigation of the claims made in behalf of **DR. DEIMEL'S LINEN-MESH UNDERWEAR,** which is truly the most healthful and comfortable fabric known to science.

DOCTOR We earnestly request your investigation of our Underwear. Samples and additional literature on the subject will be furnished by addressing

THE DEIMEL LINEN-MESH SYSTEM CO.,
491 Broadway, New York.

111 Montgomery St., San Francisco. 728 15th St., N. W., Washington, D. C.
10-12 Bread St., London, E. C.

Sold by T. B. BOYD & CO., and WM. BARR DRY GOODS CO., St. Louis, Mo.

with illuminating gas until the hydrogen has combined with the terminals, and then to repump. He tries to explain the appearances of perforated termils in vacuum tubes. He made cathodes of most of the common metals and found hydrogen in most of them; in zinc it is so abundant that this metal makes a good cathode, so far as the production of Roentgen rays is concerned. He adds some remarks concerning the reduction of the cost of Roentgen tubes. He discusses mercury cathodes; and the free electron and other ether theories of cathode rays.—*Elec. Rev.*, Jan. 10 and 17.

Cathode Radiation.—Wiechert. Elec trical World & Engineers.—An illustrated account of an experimental investigation by which he found the ratio of the charge and the mass of a cathode particle to be 12,600,000 c. g. s. units (Simon's value is 18,650,000; Digest, Dec. 23). He uses this result to determine what amount of matter is transported with each electron, or the "mass of an electron," and finds it to be the "1 or 1-1300th part of the atomic weight of oxygen." He indorses the corpuscular theory of electric conduction, believing that electricity is a form of matter which links the atom to the surrounding ether, but can be transferred from one atom to another. He favors the idea that there is only one type of electron, and that it is the negative one; this would seem to be a modern variation of the old one-fluid the ory.—*Wied. Ann.*, No. 12; abstracted in London. *Elec.*, Jan. 12.

During the past year there has been a decided improvement in electro-therapeutic apparatus and x-ray machines. Especially has this advance been made with the coil for x-ray purposes. Their have been more than a dozen designs brought out for amplifying the x-ray output, everyone of which is an advance over the method of one year ago. The writer has a radiograph showing abscess of the brain in an adult taken with two seconds exposure. Subsequent surgery, which proved successful to the patient, verified even the outlines of the x-ray findings. The working of such an apparatus will be instructive at the Roentgen Society of the United States in December.